

AMENDMENTS TO THE CLAIMS

1. (Presently amended): A digital imaging system comprising: an image acquisition unit that is capable of acquiring digital images; a correlation matrix memory coupled to the image acquisition unit; a color image database storing multiple images from actual image data; and a processor coupled to the image acquisition unit and coupled to the correlation matrix memory, the processor comprising an image processing process that is capable of detecting color and illuminance illuminants of the acquired digital images based on color and illuminance illuminants of the multiple images from actual image data stored in a the color image database.

2. (Presently amended): A digital imaging system according to claim 1 further comprising:
the processor that executes an illuminant detection training algorithm that bases control of illumination and color on a database storing actual illuminants, scenes, and subjects from representative image acquisition devices such as digital cameras and scanners.

3. (Original): A digital imaging system according to claim 1 further comprising: a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and the chromaticities being selected based on data in the database storing actual illuminants, scenes, and subjects from representative image acquisition devices such as digital cameras and scanners.

4. (Presently amended): A digital imaging system according to claim 1 further comprising:

an image acquisition unit that is capable of acquiring digital images;
a correlation matrix memory coupled to the image acquisition unit;
a processor coupled to the image acquisition unit and coupled to the correlation matrix
memory, the processor comprising an image processing process that is capable
of detecting color and illuminants of the acquired digital images based on color
and illuminants of multiple images from actual image data stored in a color
image database;

an image vector process operational in the image processing process and capable of forming an image vector based on chromaticities associated with the acquired image; and

a chromaticity assignment process of the image vector process that is capable of assigning positions of the image vector according to chromaticity, further comprising:

a data conversion process that converts RGB data from the acquired image to chromaticities selected based on color and illuminance illuminants of multiple images stored in the color image database;

a position selection process that sets a position of the image vector to a first binary value if chromaticity corresponding to the position appears in the acquired image; and

a position deselection process that resets a position of the image vector to a second binary value if chromaticity corresponding to the position fails to appear in the acquired image.

5. (Presently Amended): A digital imaging system according to claim 4 further comprising:

a matrix multiplication process operational in the image processing process and capable of multiplying the image vector by the correlation matrix to form a resulting vector; and

an illuminant selection process operational in the image processing process and capable of selecting at least one candidate illuminant from the set of candidate illuminants to be the associated illuminant in the acquired digital image based on the resulting vector, the set of candidate illuminants being selected based on color and illuminance illuminants of multiple images stored in the color image database.

6. (Original): A digital imaging system according to claim 1 further comprising: a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined for a variety of illuminants, scenes, and subjects that are expected to be of interest to users of a particular camera or group of cameras.

7. (Presently amended): A digital imaging system according to claim 1 further comprising:

an image acquisition unit that is capable of acquiring digital images;
a correlation matrix memory coupled to the image acquisition unit;
a processor coupled to the image acquisition unit and coupled to the correlation matrix
memory, the processor comprising an image processing process that is capable
of detecting color and illuminants of the acquired digital images based on color
and illuminants of multiple images from actual image data stored in a color
image database; and

a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning manufacturer, model and version of the image acquisition device, and image

acquisition devices settings at the time of acquisition.

8. (Presently amended): A digital imaging system ~~according to claim 1 further~~ comprising:

an image acquisition unit that is capable of acquiring digital images;
a correlation matrix memory coupled to the image acquisition unit;
a processor coupled to the image acquisition unit and coupled to the correlation matrix
memory, the processor comprising an image processing process that is capable
of detecting color and illuminants of the acquired digital images based on color
and illuminants of multiple images from actual image data stored in a color
image database; and

a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on information relating to actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning the manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition.

9. (Presently amended): A digital imaging system ~~according to claim 1 further~~ comprising:

an image acquisition unit that is capable of acquiring digital images;
a correlation matrix memory coupled to the image acquisition unit;
a processor coupled to the image acquisition unit and coupled to the correlation matrix
memory, the processor comprising an image processing process that is capable
of detecting color and illuminants of the acquired digital images based on color
and illuminants of multiple images from actual image data stored in a color
image database; and

a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on information relating to tags such as manufacturer and model tags to screen the digital images stored in the database according to manufacturer and model.

10. (Presently amended): A digital imaging system ~~according to claim 1 further~~ comprising:

an image acquisition unit that is capable of acquiring digital images;
a correlation matrix memory coupled to the image acquisition unit;
a processor coupled to the image acquisition unit and coupled to the correlation matrix
memory, the processor comprising an image processing process that is capable
of detecting color and illuminants of the acquired digital images based on color
and illuminants of multiple images from actual image data stored in a color
image database; and

a correlation matrix contained within the correlation matrix memory, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities, the illuminants and chromaticities being determined based on information relating to private image tag information including manufacturer and model information tags, and image data tags including focal length, shutter speed, and aperture.

11. (Presently Amended): A method of operating a digital imaging system comprising:

collecting actual image data;
storing a color image database of multiple images from the collected actual image
data;
acquiring digital images;

forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and detecting a color and illuminance illuminants of the acquired digital images based on color and illuminance illuminants of multiple images from actual image data stored in a color image database.

12. (Original): A method according to claim 11 further comprising: communicating acquired digital image data and illuminant and chromaticity data between an image acquisition device and the color image database.

13. (Original): A method according to claim 11 further comprising: basing control of illumination and color on a database storing actual illuminants, scenes, and subjects from representative image acquisition devices such as digital cameras and scanners.

14. (Presently amended): A method of operating a digital imaging system according to claim 11 further comprising: acquiring digital images; forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and detecting a color and illuminants of the acquired digital images based on color and illuminants of multiple images from actual image data stored in a color image database; forming an image vector based on chromaticities associated with the acquired image; and assigning positions of the image vector according to chromaticity, further comprising: converting RGB data from the acquired image to chromaticities selected based on color and illuminance illuminants of multiple images stored in the color image database;

selecting a position of the image vector to a first binary value if chromaticity corresponding to the position appears in the acquired image; and deselecting a position of the image vector to a second binary value if chromaticity corresponding to the position fails to appear in the acquired image.

15. (Presently amended): A method according to claim 14 further comprising: selecting at least one candidate illuminant from the set of candidate illuminants to be the associated illuminant in the acquired digital image based on the resulting vector, selecting the set of candidate illuminants based on color and illuminance illuminants of multiple images stored in the color image database.

16. (Original): A method according to claim 11 further comprising: determining the illuminants and chromaticities for a variety of illuminants, scenes, and subjects that are expected to be of interest to users of a particular camera or group of cameras.

17. (Presently amended): A method of operating a digital imaging system according to claim 11 further comprising:
acquiring digital images; forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and detecting a color and illuminants of the acquired digital images based on color and illuminants of multiple images from actual image data stored in a color image database; and
determining the illuminants and chromaticities based on actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition.

18. (Presently amended): A method of operating a digital imaging system according to claim 11 further comprising:

acquiring digital images; forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and detecting a color and illuminants of the acquired digital images based on color and illuminants of multiple images from actual image data stored in a color image database; and

determining the illuminants and chromaticities based on information relating to actual image data including tags that identify the image acquisition device that acquires a particular image, and information concerning the manufacturer, model and version of the image acquisition device, and image acquisition devices settings at the time of acquisition comprising focal length, shutter speed, and aperture.

19. (Presently amended): A digital imaging system comprising:

means for storing multiple images from actual image data in a color image database;
means for acquiring digital images;

means for forming a correlation matrix memory including illuminant and chromaticity data, the correlation matrix being a two-dimensional matrix comprising a first dimension corresponding to a set of candidate illuminants and a second dimension corresponding to chromaticities; and

means for detecting a color and illuminance illuminants of the acquired digital images based on color and illuminance illuminants of multiple images stored in a color image database.

20. (Original): A digital imaging system according to claim 19 further comprising:

means for basing control of illumination and color on a database storing actual illuminants, scenes, and subjects from representative image acquisition devices such as digital cameras and scanners.

21. (New): A digital imaging system according to claim 1 wherein:
the color image database stores information relating to actual image data including
tags identifying an image acquisition device that acquires a particular image,
information identifying characteristics of the image acquisition device, and
image acquisition device settings at image acquisition.